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SCIENCE NEWS LETTER

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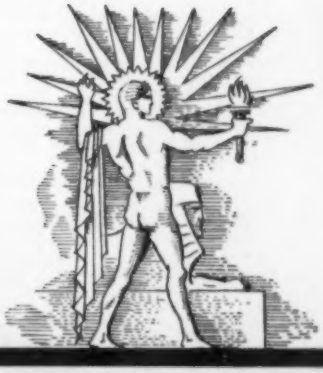

NOVEMBER 23, 1935

Returning to Earth

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Edited by WATSON DAVIS

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DO YOU KNOW?

The Ainus of northern Japan wear blue for mourning.

Potatoes became a staple crop in Europe as a result of the famine of 1771.

Fur farmers in the United States last season produced 170,000 silver-fox pelts.

If milk in clear glass milk bottles stands in the sun, it soon develops a definite tallow-like flavor.

Plans for a memorial to Thomas A. Edison include arranging for permanent care of the inventor's personal scientific library.

Chemists have found that surfaces of all solid bodies are covered with a film of water or oil, often only one molecule thick.

Research has produced waterproof lime—a processed lime with which to make mortar that repels water and protects masonry walls against leaking.

Mexico has eleven states with an average altitude of over a mile above the sea.

Twin gorillas, now four months old, are a feature of interest at the zoo in Hanover, Germany.

The Egyptians believed that the sun was hatched each morning from an egg laid by a celestial goose.

Forest fires not only destroy valuable timber but leave wounds and scars on trees, where decay soon sets in.

Small children often betray defective eyesight by the way they behave toward distant or close objects, or by strain shown in their efforts to see.

An anthropologist reports that the human brain has not increased in size since the days of Neandertal man, who lived in the Old Stone Age; and brains have decreased in size, in Europe at least, within the past 10,000 or 20,000 years.

WITH THE SCIENCES THIS WEEK

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CHEMISTRY-PHYSICS

Nobel Researches Set Off Bursts of New Knowledge

Chadwick Discovered a New Building Block of Matter While the Joliots Made New Radioactive Elements

THE Nobel prize awards to Prof. F. Joliot and Mme. Irene Curie-Joliot, in chemistry, and to Dr. James Chadwick in physics recognize two of the most important achievements in physical science in recent years:

Discovery of the neutron, now considered one of the three ultimate particles of all matter in the universe—the achievement of Dr. James Chadwick, now of Liverpool University and at the time of his discovery in 1932 at Cavendish Laboratory in Cambridge, England.

Discovery of artificial radioactivity and manufacture of new radioactive elements —the achievement of the Joliots, Parisian husband-and-wife research team, early in 1934.

The award to Irene Curie, as she signs her research papers, marked the first case of child of a Nobel prize winner receiving the Nobel prize. For Mme. Joliot is the daughter of the late Pierre and Marie Curie, Nobelists jointly with Henri Becquerel in 1903 for their work on radioactivity. The mother of Irene Curie also received the Nobel prize in chemistry in 1911, thus becoming twice a Nobelist, still a unique achievement.

Modern Alchemy

The discovery of the neutron by Dr. Chadwick grew out of the modern alchemy of physics whereby transmutation is accomplished—not the sordid turning of lead into gold desired by the ancients, but more important to science, the turning of many light atoms into other elements in small but significant amounts. Lord Rutherford, Nobelist himself and head of Cavendish Laboratory, knocked "H" (chemical symbol for hydrogen) out of nitrogen in 1919. There was one light-weight element, beryllium, that resisted similar transmutation, and it was an attack on this metal that produced neutrons.

When bombarded with a stream of helium atomic hearts let loose by that radioactive cousin of radium called polonium, there was produced from beryllium a stream of powerful radiation. The Joliots in Paris and two Germans, Bothe and Becker, thought that it was the well-known gamma radiation so useful in cancer treatment, but Dr. Chadwick recognized it as a stream of electrically neutral particles which had already been suspected from theory and had even been named "neutrons" before discovery.

Because of its electrical neutrality, the neutron has the ability to plunge itself into places that can not be reached by other atomic particles. It was immediately seized upon as a very welcome tool for prying open the atom. Used by investigators in America and elsewhere, it opened up a new bonanza of atomic knowledge.

World-Acclaimed

Two years later the achievement of artificial radioactivity by the Joliots was world-acclaimed. The persistence and unchanging nature of natural radioactivity has perplexed scientists. Try as they will, they cannot speed, slow or otherwise change by an iota the constant natural disintegration of radium or any other radioactive substance.

Man-caused radioactivity was first produced in aluminum, familiar metal. A stream of helium atom hearts was flung at a thin foil of this metal. Out came first neutrons, and then a stream of positrons, another atomic particle discovered in 1932 by Dr. Carl D. Anderson, California Institute of Technology. What was unusual and important is that the positrons were flung off for many minutes after the bombardment stopped. The atom was disintegrated not like an explosive shell but like an incendiary bomb.

Here was radioactivity made to order. There was great activity in laboratories as atomic particles of various kinds were flung by high-voltage current at various substances. A large number of substances were transmuted into new radio-elements that lived for minutes, hours or a few days and then blew themselves up with release of powerful radiations.

There was hope aroused that these new radio-elements would be of medical and industrial importance. Today it is known that plans are under way in one laboratory at the University of California to produce radiosodium in quantity in the hope that eventually it can be used in the treatment of disease through its injection into the blood streams of the patients.

The chemistry prize awarded the Joliots is for this year and the physics prize to Dr. Chadwick is the 1935 prize. The 1934 physics prize, not awarded last year, will not be awarded at all but will be added to the Nobel fund for future prizes.

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BACTERIOLOGY

No "Germs" at Altitudes Of 20,000 Feet and Over

THE AIR at altitudes of 20,000 feet and up to 28,000 feet is apparently free from "germs" or what bacteriologists call sterile, Dr. George Walker of Baltimore reports. (*Science*, Nov. 8.)

Although his right index finger was

AWARDED NOBEL PRIZE

The Joliots, husband and wife, and (right) Dr. James Chadwick.

frostbitten and both hands "suffered severely from the cold" while he was making his observations, Dr. Walker was not satisfied with his technic and states that the work was not done "with sufficient accuracy to claim the establishment of any new facts."

He did establish a record, however, for the highest altitude at which such tests had ever been made. The previous record for high altitude "germ" searches was 20,600 feet, established by Prof. B. E. Proctor of Massachusetts Institute of Technology. Others who have examined the upper air for the presence of disease germs or of fungi are F. C. Meier of the U. S. Department of Agriculture and Col. Charles A. Lindbergh who assisted Mr. Meier by exposing plates to catch possible fungus spores in a recent flight over land and water.

Dr. Walker made his flight in a new U. S. Army bombing plane. The doctor sat in the compartment provided for the machine gunner at the farthest forward point of the plane. There was a slit in the front through which he could extend his hands.

At 20,000 feet, and at every 1,000 feet above to 28,000, Dr. Walker held his hands through this slit to open a sterile flat glass dish containing solidified material on which "germs" grow. In spite of the intense cold—34 degrees below zero Fahrenheit—and wind that rushed past at a velocity of 150 miles an hour, he managed to hold the dishes open for half a minute. The dishes or plates were then brought back to his laboratory and incubated. On only two of twelve plates were there any microorganisms and these, Dr. Walker is sure, were contaminated by organisms on his hands or clothing.

Science News Letter, November 23, 1935

INDUSTRIAL RESEARCH

Textile Research Pays Million Dollars Annually

DRAMATIC answer to the oft-mentional question "Does fundamental research in industry pay?" was offered at the dinner of the U. S. Institute for Textile Research.

The estimated financial return from research investment of a few hundred thousand dollars spread over five years' time is $1,000,000 a year.

Even if the $1,000,000 saving was gained but once, the research would be good business; but the saving would be an annual one, if textile mills utilized generally the research results obtained.

Dr. E. R. Schwarz, associate professor of textile research at the Massachusetts Institute of Technology, headed the symposium which revealed the "$1,000,000-a-year" textile research. Toastmaster at the dinner was Francis P. Garvan, president of the Textile Institute and president of the Chemical Foundation.

One new textile aid, C. L. Pattee of Salem, Mass., revealed, is the use of microscopes for studying the weakness and dyeing qualities of cotton fibers.

Shine polarized light on a cotton fiber, examine it with an inexpensive low-power microscope, and the mature and immature fibers stand out from one another. Mature fibers bring strength into the cotton threads into which they are made; immature fibers are weak and will not take dyes well or uniformly.

Formerly workmen known as cotton classers went through each bale of cotton and tried—with only partial success—to recognize and sort the young from the old cotton. Considerable wastage in the form of weak yarn and poor dyeing resulted.

With the easily-learned microscope-polarized-light technique, an unskilled operator now excels the most skilled cotton classers.

Study of the size of silk fibers has removed one bugbear from silk fabrics manufacturers — two-toned dyeing — where adjacent sections of the fabric come out of the dye vats in different hues, although the same dye was used.

F. A. Mennerich, of Hoboken, N. J., disclosed that a difference in silk fiber size amounting to but three hundredths of an inch in diameter ratio was sufficient to cause the two-tone dyeing.

Flatter and larger silk filaments dye darker than the rounder and smaller filaments. Previously it had been supposed that conditions of soaking, dyeing and boiling-off the dye were the basic causes of the trouble.

The size of the silk filament is not especially important in determining a shade of silk stockings, for example. What is needed is uniformity of size within the .03 inch diameter limits.

The new technique is to grade various bales of silk as to filament size and then see that no two consecutive bales have silk filaments varying by more than the known limits. This practice is found to eliminate two-tone dyeing from about two-thirds of all lots of silk without further help.

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PHYSIOLOGY—METEOROLOGY

Forest Service Lookout Tells How Lightning Feels

U. S. FOREST Service men certainly can "take it": one of them was struck by lightning not long ago, and lives to tell the tale.

Al Moore was on lookout duty on top of a hundred-foot steel tower, set high on Quartz Ridge, in the Nezperce National Forest. A black storm rolled up. His steel perch was a challenge to the thunderbolts, bolder even than Ajax. And the lightning did not ignore the challenge. It hit that tower, Al Moore and all, a first-class stroke.

Said Lookout Moore afterwards: "My first impression was a blinding flash, but I was not aware of any crash or noise. A hit like that leaves a man with a very limp, weak feeling, soon followed by a cold sweat and an empty sensation in the pit of his stomach."

And with professional coolness he commented, "There is some satisfaction in knowing that the tower can take a direct hit and the lookout live through it."

Even without a direct hit, a steel lookout tower is an interesting place during lightning weather, as Mr. Moore describes it: "The tower always buzzes and hums as a storm approaches, and small balls of blue flame hang to each corner of the cabin roof . . . . It's good business to wear rubber-soled shoes, and to keep hands off sides of the cabin and other metal parts."

At that, for all his steadiness and nerve, Mr. Moore admitted that for days after the experience the mere recollection of it would "raise goose-pimples" all over him.

A steel tower 100 feet tall, rising high above any treetop or rock in its immediate vicinity, is a target for lightning hardly to be improved upon. That a Forest Service man stays in it, storm or no storm, watching for the first pencil of smoke a lightning-set forest fire may send up, miles away, even after the literally hair-raising experience of Lookout More went through, is surely testimony to the nerve and loyalty to the job to be found in the Service.

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AERONAUTICS-PHYSICS

Radio Enabled Scientists to Aid Stratosphere Flyers

Scientific "Ground Crew" Stood By to Serve as "Cerebral Pliers" in Case Advice Was Needed Above

See Front Cover

SCIENTIFIC experiments performed at world's record altitudes brought smiles to the faces of the scientists gathered at the headquarters of the National Geographic Society during the successful ascension of the balloon Explorer II on Nov. 11 to a new record height of over 74,000 feet.

By radio the scientists not only heard what was going on in the balloon but were able to act as "cerebral screwdrivers or pliers," as one of them put it. Dr. W. F. G. Swann, member of the scientific advisory committee of the flight, who had valuable cosmic ray apparatus automatically working aboard the balloon, so characterized himself in a two-way conversation with Capt. Albert Stevens. Dr. Swann was in New York City and Capt. Stevens was twelve miles up in the stratosphere over the now barren, winter-touched Nebraska countryside.

Nothing went wrong with the cosmic ray equipment, but by radio Dr. Swann with the "cerebral screwdriver" would have been able to offer some emergency advice if it had.

In Washington, Dr. Lyman T. Briggs, chairman of the advisory committee and director of the National Bureau of Standards, talked with Capt. Stevens about the progress of the experiment on measuring the electrical conductivity of the stratosphere. A smile lighted his face when "all's well" came through.

Catch Spores

Both Dr. Briggs and Dr. L. B. Tuckerman, also a member of the committee, leaned forward and cupped their ears when Capt. Stevens told of opening the apparatus for catching spores just after the balloon reached its peak altitude and began the descent. At each whirl of the automatic camera-exposing mechanism they relaxed, for they knew the multi-cameras were taking pictures of the ground below and making permanent records of the invaluable data being registered on scores of equipment dials. What those dials read during the flight will tell many things. How the temperature varies high in the stratosphere is only one, for example.

Of keen interest to the scientists were Capt. Stevens' observations on the color of the sky at the maximum altitude. Was it black as previously reported, or a normal blue? The answer seemed to be a very dark blue-black, almost a deep violet.

The two balloonists were able to look down upon what is normally considered the sky.

So much of the air and dust particles of the atmosphere lay beneath them that the white or hazy sky, made that color by the scattering of light, was down and not up. The sky above and outward toward the horizon was deep violet, which indicated that the red and green, or longer wavelengths, of light had been captured and dissipated by the lower atmosphere. If Capts. Stevens and Anderson had had ultraviolet-sensitive eyes, the sky above them would have been brighter, with light shorter in wavelength or, what is the same thing, higher in frequency of vibration.

Capts. Stevens and Anderson were to an extent like men on the moon or on Mars in that they could look upon the earth from outside it. What they saw was very much like what could be seen from the earth's satellite or nearby planets, except they had a magnified view.

The human eyes of the two balloonists could not see through the mistiness of the atmosphere below them as well as the mechanical eyes that their gondola carried in the form of cameras with red and deep red filters. These infra-red photographs when developed will have detail that a mere human eye could not see.

Now It Can Be Told

The success of the flight hung in the balance for an hour and a half during preparations for the take-off.

Press reports merely said, "A rip in the balloon fabric was discovered during the inflation and repaired."

But both men in the balloon and scientist-members of the advisory committee on the ground held their breath every instant the balloon was aloft hoping the great 20-foot-long patch would hold.

It did, and the Army's non-commissioned balloon officers from Scott's Field have won thanks which in war time would merit military citation. Their

READY TO SOAR

Warmly clad for the ascent to unknown heights are Capt. Albert W. Stevens, left, commender of the expedition and Capt. Orvil A. Anderson, pilot. This photograph and the one on the cover were furnished by the National Geographic Society.

names are Master Sergeant J. H. Bishop and Staff Sergeant Olaf Jensen. Working with them were J. F. Cooper and J. R. Kelly of the Goodyear Company, which constructed the balloon bag.

Doing a balloon repair job is one thing when undertaken in a factory on a level work bench and quite something else when made in the midst of acres of fabric sprawled on the ground.

Shortly after midnight, as the inflation was started, the flood lights revealed the 20-foot rip near the equator of the balloon. The repair men measured it quickly, rushed to the nearby gondola house, cut out a suitable patch and came back.

With quick-drying cement so sticky that two pieces of fabric coated with it and once touched together will hold fast, they carefully worked their way around the more than forty feet of edge and overlap. Giant 1,000 watt electric light bulbs nearby provided the heat necessary, for the night was cold.

A single slip in the joining might have produced a wrinkle which could not simply be pulled out smooth. Getting rid of a wrinkle required the application of carbon tetrachloride to dissolve the cement and then a new coating of the rubber cement. Each slip meant valuable minutes slipping by, which cut the time the balloon could be aloft.

While they worked feverishly, yet carefully, thoughts of stresses and strains in the balloon envelope which the patch would develop ran through their heads. The patch was strong enough, for it was heavier material than the fabric at the point of the rip. But its very presence set up stresses at the boundaries that lowered the factor of safety.

Almost impossible to calculate mathematically in exact degree, the factor of safety was lowered roughly by half through the presence of the patch. From 9 or 10 the safety factor was probably lowered to 5 or 6.

Capts. Anderson and Stevens weighed the ascension pro and con. Pro won, and the flight succeeded. But only because the repair job, made so hurriedly, stood the test.

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MEDICINE

Monkey Malaria Now Used In Treating General Paresis

MONKEY malaria has been successfully used for treating general paresis, the distressing mental illness which is an end-result of syphilis.

For certain cases, at least, this latest method of relieving an age-old scourge may prove to be better than infecting the patients with strains of human malaria, as has been done so widely and usefully since the chance discovery in 1920 of Prof. Wagner von Jauregg in Vienna.

This new method has been developed by Dr. C. E. van Rooyen, Halley Stewart Research Fellow at the University of Edinburgh, and Dr. G. R. Pile, senior assistant medical officer of the Midlothian and Peebles Asylum. (*British Medical Journal,* Oct. 12, 1935.)

One of the chief advantages is that the monkey infection can in some circumstances be kept much nearer to the doctor's hand than the human, since by suitable treatment a monkey can be kept in an infective condition for at least six months and in a laboratory close to centers of population which may be far distant from sufferers from human malaria. Other advantages are the comparatively short period of incubation with the monkey infection, the gentle onset of fever with this disease, and the particular ease with which the fever can be terminated with quinine.

Parasites of the malaria type occur commonly in the blood of monkeys, but are more or less harmless so long as they are confined to the species of monkey which is accustomed to the particular strain concerned. Not until a few years ago was it discovered that heavy infection of a malarial kind could be produced by inoculating the common Indian monkey with the parasite from another species. The strain of this parasite that has been maintained for some two years at the London School of Hygiene and Tropical Medicine was used by Drs. van Rooyen and Pile for their new attack on paresis.

This strain has been much in demand for experimental researches, and has been transmitted, via blood sent by mail, to a number of centers in Europe, and to New York, successfully withstanding the period of twelve days involved in the last instance. Early experiments with this strain of the monkey parasite showed that it was transmissible to human beings, and also that it might be beneficial for treating paresis. The more complete series of experiments conducted by Drs. van Rooyen and Pile confirm these preliminary findings, and emphasize that the use of the monkey parasite may sometimes be much more convenient and practical than that of the human malarial parasite carried by the Anopheles mosquito.

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ZOOLOGY

Black Wolf of Louisiana Takes His Own Photograph

BLACK wolves taking their own photographs at midnight, in the dark of the moon, in thick woods, down South.

It all sounds very spooky, but it really happened, and was nothing more than the carrying out of a carefully planned, scientifically prepared program.

The black wolves live in the Singer Wildlife Refuge, on the banks of the Mississippi in northern Louisiana. Their photographs were taken by flashlight, with cameras set off by cleverly concealed electrical apparatus. The photographs, published in a new bulletin of the Chicago Academy of Sciences, constitute the first known self-portraits of timber wolves made in their natural habitat.

The pictures were secured by Tappan Gregory, Chicago naturalist, with the collaboration of Robert S. Sturgis of Chicago and Stanley Young of the U. S. Biological Survey, and the assistance of a number of other Biological Survey workers.

To obtain an animal self-photograph, a charge of flashlight powder, with an electric fuse to fire it, is set on a post in a paraffined cardboard box. The wires from the fuse run to a device that closes the circuit when the animal brushes against an invisible fine wire or steps on a buried tread. So well concealed are these mechanisms that they do not show in the resulting photographs, and the animals might easily be a thousand miles from the nearest works of man, so far as visible evidence goes. The air-concussion from the explosion of the flashlight powder is used in another mechanism to snap the shutter of the camera, making the whole process automatic.

Making wolves and other beasts of the forest take their own pictures at night, is not as simple as it sounds, however. Mr. Gregory tells of a score of vexations that beset the man who hunts wolves with a camera. Other animals,

BIG BAD WOLF

from wandering pigs to over-inquisitive raccoons and bait-stealing skunks, often fire the flash, wasting all the work of a night's set-up. The apparatus itself may "go haywire" due to moisture, corrosion, or mechanical accidents.

But patience, and everlasting willingness to try it again every time something goes wrong, in the end bring their reward, in the shape of first-class pictures of the Big Bad Wolf.

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PUBLIC HEALTH

Increase in Malaria Deaths; Millions of Cases Estimated

Any Community Can Now Rid Itself of This Disease Yet It Has Been Allowed to Spread Despite Drainage

DEATHS from malaria are increasing to an alarming extent in the United States. The seriousness of the situation is pointed out by officers of the Metropolitan Life Insurance Company, who refer to "the rising menace of malaria." (*Statistical Bulletin,* Oct., 1935). According to their estimates, at least 900,000 persons are suffering from this preventable disease at the present time.

This estimate is far too low, in the opinion of Dr. L. L. Williams of the U. S. Public Health Service, who is in charge of the service's malaria investigations. Dr. Williams estimates that there were two million cases of malaria in 16 southern states during 1934. He thinks the number of cases has dropped off a little since the 1934 peak, but the 1935 figures will not be available until the end of the year.

The number of cases is not known exactly, but is calculated from the deaths reported. Some authorities estimate 200 cases for every death, but Dr. Williams believes 500 to 1,000 cases for each death is more nearly accurate. Malaria accounted for 4,520 deaths in the United States during 1934, latest year for which figures are available.

The deaths and untold suffering caused by this disease can be prevented. On this point the editor of the *Statistical Bulletin* states:

"It is an indisputable fact that any community can now rid itself of every trace of this disease if it so desires. All that is necessary is the application of the principles laid down by General Gorgas in his work in Cuba and the Panama Canal Zone more than 30 years ago."

The general impoverishment of the people since the depression has been blamed by some for the alarming increase of malaria in the South. The feeling is that people have been too poor to buy quinine or other anti-malaria remedies. On the other hand, it is pointed out that most of these states have had considerable CWA and FERA assistance for their drainage programs and this should have helped to offset the unfavorable effects of the depression.

Dr. Williams explains, however, that malaria rises and falls in curves which reach peaks of high malaria prevalence every seven years. In 1934 the biggest peak in 25 years was reached, Dr. Williams thinks.

"Malaria is not a static thing," he said. "It ebbs and flows like the tides."

When the curve goes up, malaria also spreads geographically, cases and outbreaks occurring in the regions that usually have none at all.

In 1934, for instance, there were small epidemics in New Jersey, Ohio and Michigan. In addition, more people in malarial regions have the disease, they are sicker and the number of small epidemics increases. It is from observations of these conditions as well as from death rates that the U. S. Public Health Service officials make their estimates of the amount of malaria in the country.

A drop in malaria, beginning about now, is expected by Dr. Williams because he figures it is time for the curve to start its natural downward course and also because of the tremendous amount of drainage work done under the WPA. Twenty thousand miles of main outlet ditch have already been completed and about that much more will be dug before the program is over.

Most of the malaria cases in the country are in southern Virginia, South Carolina, North Carolina, Georgia, Florida, Alabama, Mississippi, the western half of Tennessee, the western tip of Kentucky, the southern tip of Illinois, southwestern Missouri, Arkansas, the southeastern quarter of Oklahoma, Louisiana, the eastern third of Texas, and the Rio Grande valley of New Mexico. In addition, there is always a little malaria in San Joaquin Valley, Cal., and the Willamette Valley, Ore. These last two malaria centers, however, do not give health authorities much concern as the disease is neither very severe there nor does it spread from there to other regions.

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RADIO

New Life-Boat Radio Has Sending Range of 75 Miles

LATEST answer of science to the government's requirements of better safety at sea was demonstrated recently in the form of a small radio transmitter for life-boats which has a range of communication of at least 75 miles.

After January 1 all ocean-going passenger ships of 2,500 gross tons or more will be required to have their motor life-boats equipped with radio-telegraph apparatus capable of communicating at least 50 miles.

In trials from the life-boats of the S. S. Pennsylvania, communication was established from the boat, in New York Harbor, with the life-saving station at Tuckerton, N. J., 75 miles down the coast. Estimates place the range at 150 miles over open water.

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MEDICINE

Don't Let Diabetic Child Go Hungry, Doctor Warns

A WARNING against under-feeding children who suffer from diabetes was sounded before the American Dietetic Association.

Dr. Henry John of Cleveland, Ohio, declared that it is no use for physicians to prescribe a low diet, insufficient to satisfy the diabetic child's hunger. So keen is the child's misery that either his mother will feed him snacks to be rid of his continuous complaining, or else the child will desperately steal food. The proper diet prescribed should be ample to satisfy hunger, the diabetes specialist emphasized.

Dr. John drew a bright picture of the diabetic child's fate today, in contrast to the grim course of the disease in days before insulin was discovered. Before insulin, the diabetic child starved to death, crying for the food that could not be increased for fear of hastening the end.

Insulin, which has given diabetic children not merely existence but active and happy life, was pronounced by Dr. John "one of the most triumphant and thrilling stories in all the history of medicine."

No longer a living skeleton, the diabetic child today is likely to be indistinguishable from non-diabetic youngsters. In fact, those who receive properly regulated diet, with suitable injections of insulin to supply the deficit that the body fails to manufacture, often appear better nourished than their normal playmates.

Admitting that taking insulin injections several times a day is no fun, Dr. John stressed the fact that diabetic children gain valuable lessons by the self-discipline and persistence they have to practice.

He said: "Having diabetes has made them better persons, I think." Children with diabetes are generally bright.

"Some of the children I have cared for have gone through college with honors and are now filling important positions," the specialist stated.

In feeding diabetic patients, Dr. John warned the dietitians against indiscriminately giving doses of insulin half an hour before meals. If the patient's blood sugar chances to be high, no harm is done. But if it is low, the lapse of time may result in an insulin reaction setting in. The child is then reduced to a dazed state of extreme artificial hunger. He gulps his food wolfishly, getting no pleasure, and digestive processes may be disturbed.

"Standing orders of this type which are to be found in many hospitals are thus not only most unscientific," said Dr. John, "but are actually barbarous at times."

Science News Letter, November 23, 1935

ANIMAL NUTRITION

Poultrymen Learn How To Color Eggs—Inside

POULTRYMEN are now being told how to color eggs. No—not for Easter, not this far ahead. The idea is to color the egg inside the shell, making the yolk pale yellow or deep orange, to suit the egg-buying customers.

Deep-colored egg yolks are liked by housewives for cake making, to give the cake a golden color. They are also in demand for some ice creams, the U. S. Department of Agriculture has noted. Poultrymen can get hens to produce pale or deep-colored yolks by the simple device of feeding them accordingly, the Department points out.

Small amounts of pimento or chili pepper in regular rations will give the yolk a deep orange-red color. Feeding white corn, instead of yellow, and limiting the green feed will make the yolks pale. But hens on this latter ration will need codliver oil to supply the vitamin A they miss by not getting yellow corn.

Richer shades of yellow may be obtained by increasing yellow corn and green feed in the ration. But, again, egg color artists are warned to be careful. Too much green feed will give the yolks a brown or green off-tint.

Science News Letter, November 23, 1935

IN SCIE

MEDICINE

Vision Vaccines by Pills Instead of Needle Prick

VACCINATION against disease by swallowing a pill or capsule instead of by the hypodermic needle is the picture of the future presented by Dr. Lloyd Arnold of the University of Illinois College of Medicine at a joint meeting of the Indiana-Michigan-Ohio Societies of Bacteriologists.

By "playing a trick on the stomach" scientists have found a way to make vaccination by mouth a success, Dr. Arnold explained. The trick consists in taking a bile pill thirty minutes before the vaccine pill is swallowed. The bile pill tricks the stomach so that it does not produce digestive acids that would destroy the vaccine. The vaccine is slowly absorbed from the pill by the lower part of the digestive tract without causing any inflammation, thus eliminating the swelling, redness, soreness, headache, backache and slight fever which may occur when the vaccine is injected under the skin of the arm.

Dr. Arnold said that considerable evidence has been accumulated to show that resistance to diseases such as typhoid fever, infectious diarrhea, bacillary dysentery and recently the common cold can be conferred by giving a vaccine by mouth. He pointed out, however, that there is considerable uncertainty as to the mechanism of immunity or resistance.

Science News Letter, November 23, 1935

TEXTILES

Billy-Goat Whiskers No Longer Wasted

THE CHIN whisker crop raised by thousands of Angora billy-goats has at last found a commercial use. Upholstery makers in Bristol, R. I., have discovered that goat whiskers make very good rugs and carpets.

The whiskers are pronounced strong and durable and capable of taking dyes well, so thousands are being used in rug making.

Science News Letter, November 23, 1935

EE FIELDS

MARINE ZOOLOGY

Lowly Sea Worm Helped Columbus Find America

IT WAS a lighted sea worm, not a flickering torch in the hand of a native, that Columbus saw from his flagship the anxious night before he discovered America.

With this biological explanation, one of the mysterious features of the discovery voyage is believed cleared up at last.

The light, which Columbus described as "like a small wax candle which rose and fell," was probably the luminous display of sea worms known as syllids, L. R. Crawshay of the Marine Biological Association Laboratory at Plymouth has reported. (*Nature,* Oct. 5) October is one of the months in which the illumination has been noted and it occurs usually around the last quarter of the moon, both points fitting America's discovery date.

Science News Letter, November 23, 1935

PUBLIC HEALTH

Health Officer Warns Against Heating Hazards

THE artificial heat which makes it so easy for modern man to keep his home warm in winter has its health hazards, Dr. Wilmer H. Schulze, director of the bureau of environmental hygiene of the Baltimore City Health Department, pointed out.

Chief of the hazards is the danger of poisoning from carbon monoxide, odorless, colorless and tasteless gas which can steal unnoticed into the home and strike down its victim before he knows what has happened.

"Keep in mind," warned Dr. Schulze, "that any fuel, whether wood, coal, oil or gas when incompletely burned, produces varying amounts of the poisonous gas carbon monoxide. Remember also that carbon monoxide is an odorless, colorless, and tasteless gas and therefore gives no warning of the danger of its presence.

"In order to avoid contaminating the air in your home with this gas the products of combustion from the heating plant are piped into a chimney and escape into the outside air. As long as there is no obstruction to the free passage of the gases to the outside, there is little danger of carbon monoxide hazard. Accumulations of soot in chimneys and vent pipes, solid objects which have fallen into the chimney or something that is entirely shutting off the chimney draft may result in carbon monoxide permeating the house because of the incompletely burned coal."

Dr. Schulze advises householders to have their heating plants and chimneys inspected to avoid this danger. The inspections should be made before the cold weather sets in and again periodically during the winter.

Gas heaters in rooms may also be a source of carbon monoxide. They should be connected with rigid metal piping, never by plain rubber tubing or spiral metal tubing. It is safer not to leave a gas appliance operating in a room throughout the whole night. An accident may put out the flame with the result that the occupants of the room are exposed to dangerous amounts of carbon monoxide while asleep.

Dr. Schulze's warning was broadcast over the Columbia Broadcasting System under the auspices of Science Service.

Science News Letter, November 23, 1935

PHYSICS

Cosmic Rays Charged Equally Positive-Negative

COSMIC rays which continually bombard the earth from outer space must be electrically-charged equally positive and negative—not predominantly positive as believed by Dr. A. H. Compton and other leading authorities on the rays.

This opinion is expressed by Dr. W. J. Walke, British physicist working at the Radiation Laboratory of the University of California. (*Nature,* Oct. 26)

Dr. Walke's argument is that if the earth had been bombarded, throughout its existence, by a cosmic radiation whose electrical charge is predominantly positive, it would gradually have acquired a high positive potential. It should, therefore, by now have reached a point where its high positive charge would repel the positive components even of the powerful cosmic radiation; at the same time it would strongly attract the negative components, so that the net result would be an eventual decrease of the earth's potential until the reaching of a point of equilibrium—with equal numbers of positively and negatively charged rays coming to the earth.

Science News Letter, November 23, 1935

PALEONTOLOGY

Crazy Mountain Region Once Had Weird Population

WEIRD animals lived on the plains of Montana, in days so long ago that the grasses now dominant on these great spaces, were only a struggling minor botanical family. In this world of seventy million years ago there were no animals that even remotely suggest the modern mammals ancestrally, though some of them had habits like those of present-day types.

Studies now being conducted by Dr. George Gaylord Simpson, paleontologist of the American Museum of Natural History, have already turned up more than sixty species of this strange fauna, in Smithsonian Institution collections made by the late Dr. James W. Gidley in the Crazy Mountain region of Montana. They range all the way from squirrel-sized creatures regarded as distant relatives of the great family of primates of which men and monkeys are members, to creatures called for convenience bear-dogs, though they were not ancestral to either. These latter beasts apparently were carrion-feeders, with hyena-like habits. The collection also includes some very primitive early forms of hoofed animals.

The epoch in which these creatures lived is known as the paleocene. It came after the dinosaurs had vanished, and constituted a sort of prelude in time to the great Age of Mammals.

Science News Letter, November 23, 1935

SEISMOLOGY

West Indian Earthquake Had Submarine Epicenter

THE WEST Indies earthquake on Nov. 10, that caused property damage on the islands of Antigua and Montserrat, centered under the sea about forty miles southwest of Antigua. Seismologists of the U. S. Coast and Geodetic Survey determined the epicenter, after examining telegraphic reports gathered by Science Service. The exact location was in latitude 16.7 degrees north, longitude 62.2 degrees west; time of origin was 1:27.5 p. m., Eastern Standard Time.

Stations reporting were those of the Jesuit Seismological Association at St. Louis University, St. Louis, Mo.; Georgetown University, Washington, D. C.; Canisius College, Buffalo, N. Y.; the University of Wisconsin, Madison, Wis.; and the Philippine Observatory, Manila, P. I.

Science News Letter, November 23, 1935

MARINE ENGINEERING

New Aid for Deep Sea Divers Adopted by British Navy

Steel Cylinder With Doors Top and Bottom Serves As Combined Diving Bell and Decompression Chamber

By CAPTAIN E. W. BROWN, Medical Corps, U. S. Navy

AS THE diver descends in the sea he is subjected to increasing pressure which is transferred to the air in his suit, and thence to the lungs. This causes a corresponding increase in the amount of gases in the body. The pressure of abnormal amounts of nitrogen gas from the air in the body causes no inconvenience while the gas is in solution, but should the pressure be released too rapidly for the gas to escape through the lungs, bubbling occurs. This bubble formation is the cause of caisson disease—the bugbear of all who work under increased air pressure. Prevention of caisson disease, the "bends," depends upon the gradual reduction of pressure by bringing the diver up slowly by stages.

The time taken in bringing to the surface a diver who has been working at a depth, say of 204 feet for one hour, is 124 minutes, implying a considerable waste of working time, and a considerable feat of endurance when it is considered that he is hanging on a rope suspended in mid-water, often in winter, or even in summer at a temperature possibly of 40 to 50 degrees Fahrenheit and in a strong tideway.

Diving Decompression Bell

In order to overcome this difficulty Sir Robert H. Davis of the British Admiralty Diving Committee has designed and produced a steel chamber which when submerged acts as a diving bell and when closed as a decompression chamber. The device is known as the Davis Submersible Decompression Chamber and has been adopted by the British Navy.

The Davis device is a steel cylindrical chamber which is fitted with doors at the top and bottom. An attendant goes down in the chamber and waits to receive the diver at a depth corresponding to his first stop if he were ascending in the standard way. If the depth were 300 feet, this would be 66 feet. The lower door is kept open and water kept out of the chamber by compressed air pumped into it. The diver ascends and enters the chamber on completion of his job, the lower door is closed and he is hoisted aboard the diving vessel without releasing the air pressure from his body. A long decompression can then be conducted in warmth and dryness instead of under water in the cold and comparative darkness.

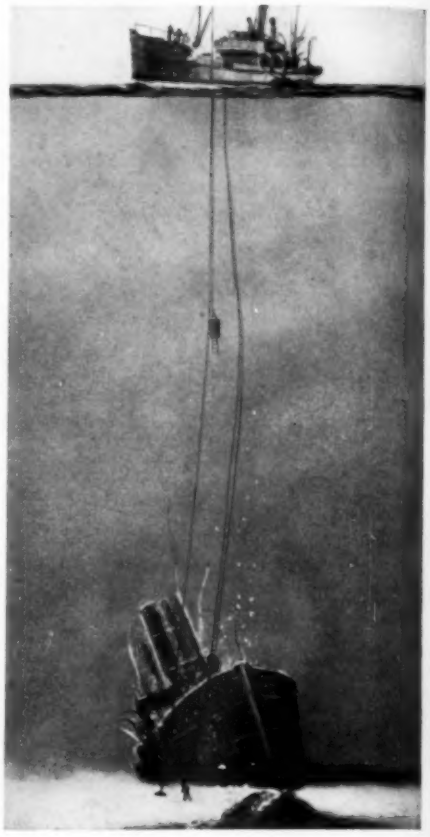
Minimizes Exposure

As a result, it is possible for the diver to go safely to greater depths and he is relieved of the discomfort and monotony of waiting on the ascending line for the decompression periods. It reduces to a minimum his exposure to cold and strong currents. The period of decompression can be reduced 40 per cent. by the breathing of oxygen by the diver during decompression and it is thus made possible to extend the period of useful work on the bottom.

Where the diving operations are on a large scale, as in extensive salvage work, it is proposed to install in the diving vessel special stationary decompression chambers to which the divers in the submersible chambers will be transferred in order to complete their schedule of decompression. In this way, a number of divers can be kept going whenever diving is possible. In diving operations one has to take advantage of favorable weather to speed up the work.

There is no doubt that the device here described represents a conspicuous advance in the art of deep-sea diving, thus making another milestone in the history of its development.

Science News Letter, November 23, 1935



HALF WAY DOWN

The small object on the line half way between the ocean's surface and the diver below is a decompression tank—new aid to divers.

MARINE ENGINEERING

Less Roll For Liners In New Ship Design

SUGGESTIONS for the design of ocean liners with less roll than present ones were offered to the meeting of the Society of Naval Architects and Marine Engineers.

The potential boon to seasick passengers was the result of studies on the gyro-stabilized Italian liner Conte di Savoia by P. R. Bassett and F. P. Hodgkinson of the Sperry Gyroscope Co.

Three years of study and operation of the three great 110-ton gyroscope stabilizers aboard the ship, the Sperry engineers declared, indicate that roll is reduced from between fifteen and twenty degrees to not more than six degrees with the gyro equipment in operation.

The investigations indicated, however, for the first time that all the oscillating inclinations of the ship's deck were not due to roll alone. Superimposed on the roll was yaw-heeling, a motion quite similar to roll in its action but due to waves quartering on the vessel from the stern.

In ordinary ships, Messrs. Bassett and Hodgkinson point out, roll and yawing are never separated. With the Conte di Savoia yawing alone was allowed.

"So far as we know," they stated, "this is the first time that any mention has ever been made of the fact that all periodic inclinations are not roll.

"As a result of our studies," the speakers added, "we have attempted to outline the requirements for a more naturally comfortable and steadier ship than that of usual design. The principal requirements are that the ship must have a long period of roll and a low center of gravity. The problem of steering must also be considered with the purpose of reducing yawing to an absolute minimum.

"While we do not presume to say that a ship can actually be designed in accordance with these requirements, we do feel that improvement in sea qualities can be obtained if attention is paid to these requirements."

"In the usual design of present-day ships the center of gravity is considerably above the center of the vertical water plane. Consequently, each yaw causes a centrifugal force which manifests itself in heeling of the ship, or causing what we have termed 'yaw-heel.' Unfortunately, the direction of this yaw-heel invariably augments the normal rolling and will even cause rolling when theoretically none should exist. We believe this is why some ships for no apparent reason have turned out to be notorious rollers."

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TO PREVENT BENDS

This decompression tank makes it possible for the deep sea diver to rise to the surface in much less time than usual without developing the dreaded bends. The diver, entering the tank, has removed air and telephone lines shown outside the tank on the left.

METALLURGY—MEDICINE

Tungsten Alloy Aids Cancer Treatment by Radium Rays

Combined With 5 to 10 Per Cent. Copper or Nickel, Shield Can Be Made Much Smaller Than Lead Bomb

A NEW tungsten alloy which effectively takes the place of more bulky lead as a "screen" when massive doses of radium rays are being administered has been developed for use at the Westminster Hospital, London.

The bomb-shaped containers in which large packs of radium are shielded in hospitals can be made much smaller with the new alloy and yet have the same screening effect. A volume reduction to nearly half the former size is attained.

More compactness means that the patient can be placed closer to the source of the radium rays, if need be, and receive more intense radiation.

The new tungsten alloy resulted from the researches of Sir John McLennan while he was scientific advisor of the Radium Beam Therapy Research Company and of Dr. C. J. Smithells of the (British) General Electric Company. Sir John recently died while on a vacation on the continent.

When massive doses of gamma rays from radium are administered to cancer patients, a large amount of radium is necessary. Many authorities believe not less than four grams of radium, valued at close to $200,000 is the minimum. This potent radium pack is shielded so that its piercing gamma rays do not strike doctors and nurses or any parts of the patient's body except the afflicted area.

The complete equipment, radium and its shield, is known as a radium bomb.

Although lead is easily shaped and machined, and is relatively cheap, it takes a somewhat unwieldly size of lead bomb to provide adequate screening for four or more grams of radium.

The screening effect of lead is due to its high density (11.35), the degree of absorption of gamma rays by metals being nearly proportional to the density of the metal.

Plainly, a smaller quantity of a denser metal than lead would have an equivalent screening effect, but the only suitable metals in this category are gold, platinum and tungsten. Of these the first two are prohibitively expensive.

There remained tungsten, best known in the form of electric lamp filaments.

Tungsten's high theoretical density (19.3) is only found when the metal has been treated by expensive metallurgical processes.

The difficulty of cost was overcome by the tungsten alloy. By adding from 5 to 10 per cent. of either copper or nickel, an alloy of a density in the neighborhood of 17 could be successfully evolved on the desired scale, and for about $5.00 per pound.

The tungsten alloy radium bomb is only 64 per cent. as large as the lead bombs previously used. The size is in the ratio of the densities of the two materials, 11 to 17.

The new tungsten alloy has been adopted for use by the Westminster Hospital for its 4-gram radium bomb now being constructed under the direction of Dr. H. T. Flint and C. W. Wilson. It is also to be used for the radium bomb at Birmingham, England.

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RADIO

Sending Facsimiles by Radio Possible Soon

HIGH-SPEED radio transmission of complete facsimiles of any written, typed or printed material will be inaugurated on an experimental, non-commercial service between New York and Philadelphia before the end of the year, General James G. Harbord, chairman of the board of the Radio Corporation of America, indicated in an address at Princeton University.

The facsimile service and television are linked hand-in-hand, declared General Harbord, for research in one aids the other because of the similar problems.

Television is nearer today, he added, than was the possibility of sending a telegram across the ocean with wires on the eve of Marconi's first translantic wireless test.

Science News Letter, November 23, 1935

Leprosy attacks far more men than women.

GEOGRAPHY

Redfern Probably Not Alive

Ethnologist Returning From Venezuela Reports Area Has Been Approached by White Miners and Farmers

"IN MY opinion it is extremely unlikely that Paul Redfern will ever be found alive."

This is the verdict of Dr. Vincenzo Petrullo of the University Museum, University of Pennsylvania, expressed in an exclusive interview with Science Service on his return from Venezuela.

Dr. Petrullo headed a joint expedition of the University Museum, Columbia University and the Latin American Institute, to study the Guajiro Indians.

While Dr. Petrullo on this expedition did not visit the exact country in which Redfern has been reported alive, yet not only is he familiar with the jungle and Indians of South America, but he has also discussed Redfern's fate with people in the region.

The territory that is supposed to hold the mystery of the unfortunate aviator's fate, the man who eight years ago left Brunswick, Georgia, for Rio de Janeiro and who was lost, is wild and unmapped, according to Dr. Petrullo. Strangely enough, the world depression and rise in the price of gold, Dr. Petrullo said, are forcing white men into this country from the north in search of gold, and at the same time forcing white men out of the country to the west, where there were farms. Unable to make farms pay in these times, their owners are abandoning them, and the land is reverting to the Indians of the jungle.

Highly Organized

The men who are seeking gold include not only the unscrupulous adventurers always found seeking new frontiers and fortune but also highly organized companies employing geologists and airplanes in prospecting. To one of these latter men, a man of exceedingly good reputation, the Indians had on one of the prospecting trips, shown a piece of airplane fabric and told a story of a plane being in a tree. This probably was Redfern's plane.

Knowing the Indians of the region, and the country itself, Dr. Petrullo feels that, if Redfern were alive, in eight years he would have come out of the jungle.

While these Indians are still little known to white men, and are hostile, in a measure, to each other, Dr. Petrullo says that they would most probably not attack a single white man who was helpless among them, and they would assist such a man out of their country.

The strongest argument, by far, against Redfern's being alive, Dr. Petrullo stated, is the fact that Felix Cardona, a Spaniard, passed through the very country in which Redfern is supposed to be, in 1930.

Indians Trusted Him

Cardona made three geographical expeditions through this country, sponsored by a wealthy man, A. Jahn. So great was the confidence displayed by the Indians in Cardona, that at one place they waited two years for his return. Cardona found the map of the region greatly in error. Even mountain ranges were misplaced on the present maps.

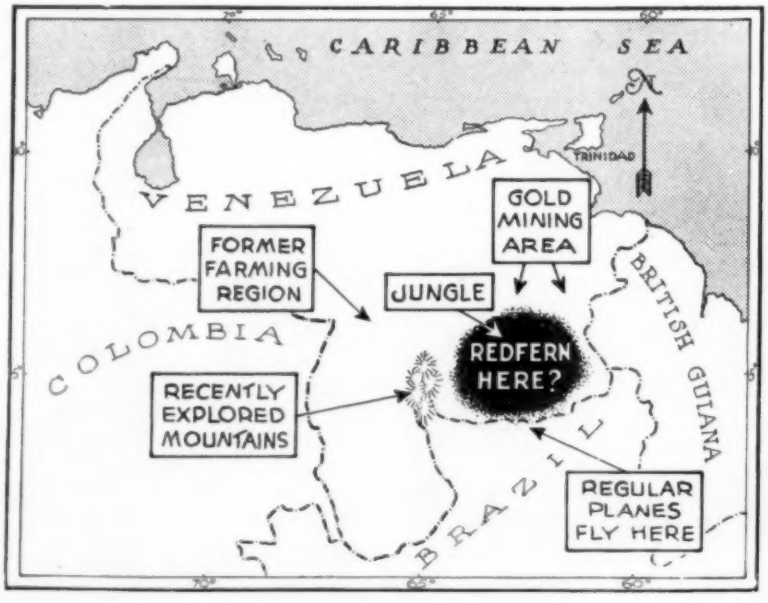
Surely, reasons Dr. Petrullo, the Indians would have told Cardona about any white man living in their midst, because they showed absolute faith and confidence in Cardona; in fact, he traveled amongst them alone for years. Yet Cardona makes no mention of any story regarding Redfern having been told him.

Nomadic Tribes

Dr. Petrullo also points out that these Indian tribes are nomadic, and at the very best semi-nomadic. It would be extremely difficult to find a tribe. Dr. Petrullo also feels that had Redfern been alive he could have come out of the country, because Cardona, for one, has gone in and out three times, alone.

Airplanes are unusual but not weirdly so to these Indians, because for years the Brazilian-Venezuelan Boundary Commission has been working near this region, using planes in an effort to fix definitely the boundary line. The Indians, for the most part, have either seen or heard of planes.

The plight of Redfern, or rather his fate, Dr. Petrullo points out, shows the extreme hazard of the direct straight-line air route over the jungles to the great cities of South America. While the route is shorter, the dangers are great, so the air-lines still follow the coast. Di Pine-



CLOSING IN ON REDFERN

Is Paul Redfern alive in this region, where Indians have displayed a fragment believed to be part of his wrecked plane? "Very doubtful he lives," says Dr. Vincenzo Petrullo, just returned from Venezuela. With gold miners, farmers, explorers, and aviators around, definite news of a white captive would have surely leaked out.

do, Italian aviator, flew over this section successfully.

There are cases on record where the Indians have held white men prisoners, Dr. Petrullo points out, but none of these are of recent date. The lure of gold is taking men into this jungle deeper and deeper, and some day more may be learned of Redfern's fate; in fact his plane wreck may be found, but Dr. Petrullo feels that there is small chance indeed that he is alive.

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CHEMISTRY

Tarred Roads Spoil Wine Taste, is Claim

SURFACING roads through vineyard regions, by the hot tar process, brings about bad flavor in the wine, is the claim advanced by German vintners. The tar vapors, that fill the air while the road work is going on, condense on the grapes, and tar particles settle on them out of the dust later on. Surfacing of roads with a cold asphalt emulsion is recommended as a way out of the difficulty.

Science News Letter, November 23, 1935

MEDICINE

Blood Pressure Machines At Fairs Disapproved

AMUSEMENT parks and fairs will have to get along without a popular new attraction if the American Medical Association can have its way.

The latest device to attract customers at fairs is an apparatus for measuring blood pressure. For a dime the customer learns what his blood pressure reading is. If he is of the nervous type, he begins to worry.

The great danger to the public is in the use of such apparatus without the necessary medical background for interpreting the results, according to an editorial in *The Journal of the American Medical Association.* (Nov. 9)

"Any single reading of blood pressure, pulse rate or even temperature, without relationship to the general physical and mental condition of the person concerned, is bound to lead to false interpretations and the associated hypochondria," the editor states. When approached by physicians, the manufacturers of such apparatus "protest earnestly and long that they are doing their utmost to stop the sale of such devices to persons outside the medical profession," the Medical Journal states.

Science News Letter, November 23, 1935

HISTORY OF AGRICULTURE

NATURE RAMBLINGS
by Frank Thone

Farmers Without Animals

OUR TABLES on Thanksgiving Day are a grand summary of the plants cultivated and used by Indians, and adopted readily enough by white men: white potatoes, sweet potatoes, corn, pumpkin, squash, tomatoes, peppers, beans of many kinds, cranberries, avocados, peanuts, Brazil nuts, black walnuts, hickory nuts (including pecans), tapioca, chocolate, vanilla, with tobacco to top it all off. The Indians of the great cultures of Mexico and the Andean uplands were versatile farmers and raised a considerable variety of crops. But they had very few domestic animals. Even the less civilized Indians first known to the English and French settlers in North America did a good deal of farming, and taught the white immigrants how to raise corn, pumpkins and many other products. But these northern tribes had no domestic food animals at all, if we except the dog—which the Caucasian newcomers declined with thanks.

The one really important animal contribution of the New World to agriculture and the dinner table has been the turkey. The nations of Mexico and Yucatan had turkeys in great abundance when the Spaniards came, and both the bronze and white varieties were introduced into Europe very promptly. Within a generation after the death of Columbus, the bird was already figured and described in Conrad Gesner's *Historia Animalium* as "the fowl of the Indies." It got the name turkey later, probably by its introduction into the then Turkish lands of the lower Danube and thence to the northern and western parts of Europe.

Our domestic turkeys are descended from these Mexican turkeys, re-introduced from Europe, and not from their wild cousins of our own forests. So when we carve the turkey on Thanksgiving Day we may be continuing a laudable practice initiated by the Pilgrim Fathers, but we shall not be working on exactly the same kind of bird.

One reason why the red natives of the Americas had so few domestic animals, probably, is that there were almost no animals here that could be tamed. The beasts we commonly think of as typical of the American forest and prairie faunas—deer, elk, bison, pronghorn, bighorn, peccary—are still either too shy or too fierce and intractable to be captured and tamed. So the Indian let them rove and contented himself with hunting them when he wanted meat. Only the turkey, and in South America the llama and alpaca, could he induce to share his villages and serve his purposes.

Science News Letter, November 23, 1935

RADIO

Tuesday, November 26, 4:30 p. m., E.S.T.

OCEANS AROUND US, by Capt. Jean H. Hawley, Assistant Director, U. S. Coast and Geodetic Survey.

Tuesday, Dec. 3, 4:30 p. m., E.S.T.

AMERICA 8,000 B.C., by Edgar B. Howard, University Museum of the University of Pennsylvania.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

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•First Glances at New Books

History

TERRA NOVA: THE NORTHEAST COAST OF AMERICA BEFORE 1602—Charles K. Bolton — *Faxon,* 194 p., $3.50. It is no easy task to write a chapter of American history as full of ifs and question marks as the period of Viking voyages. Mr. Bolton makes a vivid narrative of it, meanwhile trying to steer a fair course through events probable and improbable. Whether you believe in it or not, there is drama in the meeting of two ladies named Gudrid on American soil, and in the walking trip of one David Ingram who tramped from the Gulf of Mexico to New Brunswick.

Science News Letter, November 23, 1935

Astrophysics

MOUNT ST. KATHERINE, AN EXCELLENT SOLAR-RADIATION STATION — C. G. Abbot—*Smithsonian Institution,* 11 p., 10c. An account of the selection of the site for the Smithsonian Institution's new solar radiation observatory.

Science News Letter, November 23, 1935

Radio

EXPERIMENTAL RADIO—R. R. Ramsey—*Ramsey Publ. Co.,* 255 p., $2.75. Since 1923, Prof. Ramsey has been building up a series of experiments in radio for use with his course in radio communication. The experiments are collected in his valuable book, now in its third edition. The total number has grown to 128 tests.

Science News Letter, November 23, 1935

Geophysics

TRANSACTONS OF THE AMERICAN GEOPHYSICAL UNION, 16TH ANNUAL MEETING, 1935 — *National Research Council,* 2 vol., 530 p., Free while supply lasts. These two volumes contain a large number of significant reports and contributions on geodesy, seismology, meteorology, terrestrial magnetism and electricity, oceanography, volcanology and hydrology.

Science News Letter, November 23, 1935

Geology

MANUAL FOR GEOLOGY I—E. T. Apfel—*Edwards Bros.,* 78 p., supplementary sheets including maps, diagrams and construction paper for exercises, $1.75.

Science News Letter, November 23, 1935

Agriculture—Commerce

ALL ABOUT COFFEE—William H. Ukers—*Tea and Coffee Trade Journal Co.,* 818 p., $15. A companion work to the author's All About Tea, now launched in its second edition. It tells of the discovery, early uses and spread of cultivation of the coffee shrub, goes into considerable detail on the history and development of the modern coffee trade, treats of the roasting and preparation of coffee and all the apparatus used therein, and winds up with an extensive coffee bibliography.

Science News Letter, November 23, 1935

Natural History

HOLIDAY MEADOW, 165 p.; HOLIDAY POND, 147 p., HOLIDAY HILL, 135 p.— Edith Patch. Illus. by Wilfrid S. Bronson—*Macmillan,* 96c. each. A new printing of Edith Patch's books, deservedly among the most popular of natural history writings for children. Any of them, or all three together, would make an ideal Christmas gift for a boy or girl of the earlier reading age.

Science News Letter, November 23, 1935

Home Economics

FOODS: THEIR SELECTION AND PREPARATION—Louise Stanley and Jessie Alice Cline—*Ginn,* 458 p., $2.60. The college student who masters this text should gain a real appreciation of "the science and art underlying the job of providing three meals a day." It might also be commented that an intelligent and curious-minded homemaker who merely skimmed through the pages would find many whys of nutrition and cookery interestingly explained. It is a very readable text.

Science News Letter, November 23, 1935

Home Economics

LABORATORY MANUAL FOR A COURSE IN FOODS: THEIR SELECTION AND PREPARATION—Louise Stanley and Jessie Alice Cline—*Ginn,* 140 p., $1. To get most satisfactory results, the laboratory work in this manual should precede the parallel assignment in the textbook (reviewed above). Students are encouraged through the experiments to develop and analyze recipes.

Science News Letter, November 23, 1935

History of Science

FRENCH SCIENCE AND ITS PRINCIPAL DISCOVERIES SINCE THE SEVENTEENTH CENTURY — Maurice Caullery—*French Institute in the U. S.,* 229 p., $1.25. A compact but comprehensively summarizing history of French science in modern times, offered originally as a course of lectures in New York City. M. Caullery shows himself a master of terse English.

Science News Letter, November 23, 1935

Microscopy

WORLD BENEATH THE MICROSCOPE —W. Watson-Baker—*Studio Publications,* 16 p., 80 plates with descriptive text, $2.50. Insect eyes, spiderwebs, foraminifera shells, cross-sections of plant stems, starfish plates, snail teeth—all the infinite, amazing world of beauty that lies beyond naked-eye vision, beautifully illustrated and briefly described. This book should win many recruits to the serious hobby of microscopy.

Science News Letter, November 23, 1935

Ethnology

OUR INDIANS, THE STORY OF THE INDIANS OF THE UNITED STATES—A. Hyatt Verrill — *Putnam's* 285 p., 43 illus., $2.50. A book for young people —especially boys—who like Indians. Mr. Verrill writes entertainingly, pointing out numerous wrong ideas that people commonly hold regarding the native Americans, and describing the life of the various distinctive tribes. Directions for making moccasins, Indian homes, bow and arrows, and Indian beds are an attractive feature of the book.

Science News Letter, November 23, 1935

Zoology

ALL ABOUT REPTILES—W. S. Berridge—*McBride,* 270 p., $2.50. Some of the commoner amphibians are also included in this briskly written account of snakes, turtles, etc., in the London Zoo and other European collections, fairly representing the cold-blooded land vertebrates of the world.

Science News Letter, November 23, 1935

Hobbies

SHIP MODEL MAKING: THE BRIG—Frank H. Mason—*Studio Publications,* 64 p., 35c. Brief directions for making one of the simpler forms of ship models, every step illustrated with a cleancut little line illustration. This booklet, and the others in the "Hours of Leisure" series, should lead many into fascinating and relaxing hobbies.

Science News Letter, November 23, 1935

Anthropology

THE MANAHOAC TRIBES IN VIRGINIA, 1608—David I. Bushnell, Jr.,—*Smithsonian Institution,* 56 p., 21 plates, 50c. These Indians of the Blue Ridge foothills were never in close enough contact with Jamestown for white settlers to learn much about them. Mr. Bushnell has now located 12 sites where Manahoacs lived, and has studied the buried remnants of their culture.

Science News Letter, November 23, 1935

Engineering

AUTOMOBILES FROM START TO FINISH—Franklin M. Reck—*Crowell,* 92 p., 89 illus., $2. An attractively presented biography of the automobile from the time it is iron ore in the ground until it is iron rust in the junk dealer's graveyard. Grand photographs on all phases of motors and motoring secured in cooperation with two great automobile companies are included. The first chapter on the cars of 1900 is alone worth the price of the book.

Science News Letter, November 23, 1935

Philosophy

GENERATION OF THE UNIVERSE AND "DESIGN FOR LIVING"—Percy A. Campbell—*Pub. by author,* 101 p., $1.50. Philosophy of a more or less Hegelian content, but put into brisker, more palatable form than professional philosophers commonly attempt.

Science News Letter, November 23, 1935

Sociology

CONTEMPORARY AMERICAN INSTITUTIONS—F. Stuart Chapin—*Harper,* 423 p., $2.75. America's social institutions—its families, schools, churches, etc.—are essentially psychological phenomena. Taking this for his theme, the author analyzes the psychological bases of community life, drawing upon many scientific surveys and studies for facts. Prof. Chapin's concern being with present American life, he appropriately includes an appraisal of the New Deal.

Science News Letter, November 23, 1935

Trigonometry

PLANE AND SPHERICAL TRIGONOMETRY—Lyman M. Kells, Willis F. Kern, and James R. Bland—*McGraw-Hill,* 269 p., five-place logarithmic and trigonometric tables, 115 p., $2.50. Trigonometry as taught at the U. S. Naval Academy; thorough, concise and complete. A chapter on the use of the slide rule for the rough and ready working of problems is not usually found in comparable texts. A special chapter is given on the trigonometric problems of navigation.

Science News Letter, November 23, 1935

Engineering

PUBLIC LAND SURVEYS—Lowell O. Stewart—*Collegiate Press,* 202 p., $2.25. The history, methods and instructions for surveying the public domain.

Science News Letter, November 23, 1935

Radio

MEASUREMENTS IN RADIO ENGINEERING—Frederick E. Terman—*McGraw-Hill,* 400 p., $4. A book designed both as a reference work and as a text in the problems encountered by radio engineers in their measurements. It should be especially helpful if used in connection with a laboratory course in radio measurement, not as a manual of experiments but as a constant help in emphasizing the underlying principles.

Science News Letter, November 23, 1935

Anthropology

ANTIQUITIES OF THE NEW ENGLAND INDIANS—Charles C. Willoughby—*Peabody Museum of American Archaeology and Ethnology,* 314 p., $4.75. Indians of this region are famous, yet to the average person very little known. Archaeological digging has recently shed considerable light on these Indians. Dr. Willoughby describes the discoveries, and also evidence from colonial history and in collections of antiquities. The tribes thus take on, not only shape, but historic perspective, since no less than three successive occupations by primitive native groups can be traced.

Science News Letter, November 23, 1935

Physics

EXPERIMENTAL PHYSICS—Edwin Morrison and S. Elizabeth Morrison—*Blakiston's,* 235 p., 189 illustrations, $2. Physics experiments as employed at Michigan State College. The essentials of each experiment first are given, next directions for performing the test and finally a perforated detachable standard data sheet for recording information gathered.

Science News Letter, November 23, 1935

Astronomy

THE DIMENSIONS AND STRUCTURE OF THE GALAXY—J. S. Plaskett—*Oxford,* 30 p., 75c. The Halley Lecture, delivered June 5, 1935, in which recent discoveries and modern theories on galactic systems are summarized.

Science News Letter, November 23, 1935

Geography

FINDING THE NEW WORLD—Walter T. Field—*Ginn,* 429 p., $1. The adventures of 19 discoverers and explorers are told in this humanized history for boys and girls. The heroes include Eriksson, Columbus, of course, Balboa, Cortes, Coronado, Drake, Raleigh, Hudson. It is not, says the author plainly, a book to be studied, but one to be read for the joy of reading by fifth graders or older students.

Science News Letter, November 23, 1935

Soil Conservation

DESERTS ON THE MARCH—Paul B. Sears—*Univ. of Okla. Press,* 231 p., $2.50. Prof. Sears can speak of land ruination as one having authority. With a solid professional background of plant ecology and paleoclimatology, he has spent practically his entire life in the western prairie states, seeing and knowing at first hand the things whereof he speaks. He brings into the picture also a good philosophical and historical background, so that the treatment is well-rounded. And he feels deeply enough to make him eloquent. These factors unite to make his book as compelling as its subject is important.

Science News Letter, November 23, 1935

Arc Welding

PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE—*Lincoln Electric Company,* 596 p., $1.50. Arc welding in all its aspects. Third edition.

Science News Letter, November 23, 1935

Radio

MODERN RADIO ESSENTIALS—Kenneth A. Hathaway—*American Technical Society,* 204 p., $2. A practical condensed treatise in the fundamental principles of radio especially written to give radio service men a more thorough background in their field of work.

Science News Letter, November 23, 1935

Meteorology

WEATHER AND CLIMATE — Clarence E. Koeppe and Douglas C. Ridgley—*McKnight & McKnight,* 135 p., 80c. A workbook for a college course in elementary meteorology—a course which it is to be hoped many more institutions will be offering within the next few years.

Science News Letter, November 23, 1935

Physics

NOISE; A COMPREHENSIVE SURVEY FROM EVERY POINT OF VIEW—N. W. McLachlan—*Oxford,* 148 p., $2.25. British book on noise with a foreword by Sir Henry Fowler, chairman of the committee on noise appointed by the Minister of Transport. England is particularly alive to the annoying noise problem and the present book attempts successfully to present in popular fashion for British readers the background in the field.

Science News Letter, November 23, 1935

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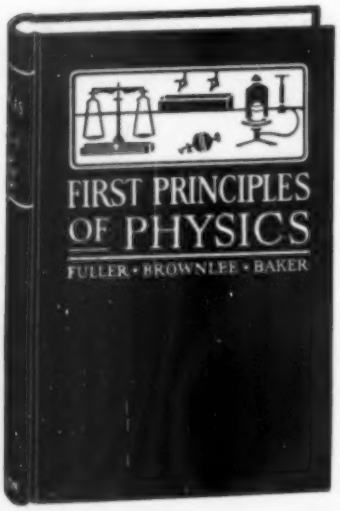
PHYSICS AND HUMAN PROGRESS

THE DEATH of General Greely recalls the heroic struggle of his party of twenty-five men some fifty years ago. For nearly three years they lost all contact with the outside world and when the rescue party found them only six were alive.

Earlier came the famous expedition of Sir John Franklin and its tragic end.

And later came the expedition of Scott, successful in reaching the South Pole, but ending in tragedy when all his party perished before they could get back to their base.

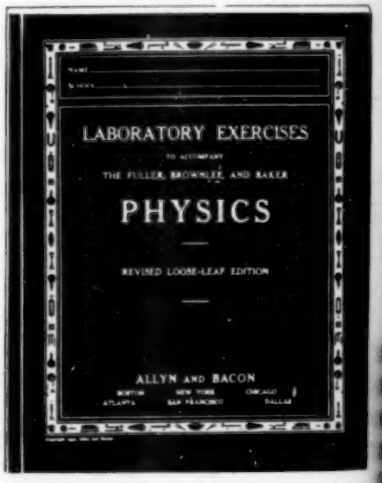


These heroic expeditions and those of Peary and Amundsen, which though more successful, were yet filled with hardship, are monuments to the indomitable will in the heart of man to surmount the obstacles that stand between him and the mastery of his world.

These obstacles in the polar regions have now been surmounted through progress in physics.

All these fatalities and hardships would have been avoided with the present development of physics.

Physics has banished the terrors of arctic exploration. The twin horrors of darkness and isolation have been conquered. Electric light vanquishes the darkness of the long night. Radio waves flash back and forth between us and Little America. We sit in our homes and listen to the explorers telling us what they have accomplished day by day.



And at the other end of the line special broadcasts bring to the explorers music and entertainment and messages from home.

Physics gives the explorer, in the Arctic or in the interior of vast continents, conquest over space. With the camera in his airplane, he can explore and accurately record the geography of wide horizons which could not be mapped by months of travel on the earth.

Physics has gathered the corners of the earth ever closer and closer together by means of great ships that float, long trains that run on shining tracks, arched bridges that balance from shore to shore, wires that carry voices, and radios that make the world a whispering gallery.

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